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V. *Some Thoughts on the Operation of the Fistula lacrymalis.* By Francis-Joseph Hunauld, M. D. F. R. S. *Regius Professor of Anatomy and Surgery, and Member of the Royal Academy of Sciences at Paris. Communicated to the Royal Society in a Letter to Tho. Stack, M. D.*

I Omit giving the History of the *Fistula lacrymalis*, of the different Species of the Distemper, or the various Methods of treating it, as Things sufficiently known ; and shall only remark, that the Intention in destroying the *Os unguis*, and *Saccus lacrymalis*, through which the Tears naturally destil into the Nose, is to procure them a new Passage thither, by the Hole thus artificially made. Wherefore, in order to keep the Sides of this Hole asunder, to prevent its filling up, and render the Flesh, which forms its Circumference, hard, and as it were callous, a Tent made of prepared Sponge, &c. is put into this new Passage, and is continued therein a Month or two. However, this Precaution, notwithstanding it happens but too often, that the Tears, instead of keeping the Road prepared for them with such Care, flow over the lower Eye-lid, as before the Operation, and occasion a Weeping, which is now become past Remedy.

'Tis easy to prove, that those very Means, which are used after the Operation to make the Tears destil into the Nose, are generally the Cause of the
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subsequent Weeping : For by filling the Wound with small Pledgets, and putting a Tent into the Hole that was made, the Orifice of the little common Canal, that serves to convey the Tears into the *Ductus lacrymalis*, suffers a Compressure, and is render'd hard, thick and callous ; whereby, as its Diameter is very small, it is easily stopp'd up. The Contusion made on this little Orifice, and round about it, brings on a Suppuration ; after which the Parts coalesce, and the Orifice of this small Canal closes up. The *Pus* or *Sanies*, that in the Course of the Distemper flow'd back both through the common Canal, and the small Canals, which are a Continuation of the *Puncta lacrymalia*, has sometimes occasion'd Excoriations ; in consequence of which happens a Regeneration of Flesh during the Dressings, a small matter whereof is sufficient to stop up such slender Ducts. In fine, those small Canals, through which nothing passes for a Month or two, that the Dressings last, either close by their proper Springiness, or their Diameters are lessen'd by their small Vessels becoming varicous. 'Tis certain, that Injections are sometimes made through the *Puncta lacrymalia* ; but the propelling Force of these Injections overcomes those Resistances, which the Cause that naturally drives the Tears into the *Puncta lacrymalia*, is not in a Condition to get the better of.

Thus it appears from the Detail of the Accidents I have enumerated, and which generally happen, more or less, that while the Artist is endeavouring to preserve a clear Passage for the Tears into the Nose, he labours, without designing it, to stop the
Entry.

Entry of the upper Part of their Canal. I hope now to make appear, that the best way to avoid part of these Accidents, and keep open the new Canal from the Eye to the Nose, is precisely to do nothing. This is what Experience has confirm'd me in, and what likewise Theory, well understood, will give us a clear Conception of.

'Tis a Thing not very easy to determine, how the Tears, and the Liquid that is continually found on the Surface of the Eye, in order to preserve the Cleanness and Transparency of the *Cornea*, can pass through the *Puncta lacrymalia*. 'Tis moreover observed, that when one lies in Bed, this Liquid enters into those *Puncta lacrymalia*, which in that Position are higher than the Eye, as well as into the *Puncta lacrymalia* of the opposite Eye. The Ascent of Liquors in capillary Tubes above the Level, might be propos'd to explain this last Fact. One might also in certain Circumstances imagine the Road which the Tears keep, to pass from the Eye into the Nose, to be a *Syphon*, the short Leg of which is divided into two. 'Tis strange that these two Ideas, which strike by their Simplicity, have not been offer'd by any one hitherto. It must be allow'd, however, that they are not entirely sufficient to account for the *Phænomenon* under Consideration. The following *Rationale* seems to me quite as simple, and more accurate.

The Air present at the Orifices of all the Ducts, which have any Communication with the *Trachæa*, is by its proper Weight determin'd to enter them, when the Resistance happens to be diminish'd. Thus as, during Inspiration, it passes through the Mouth
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and Nostrils, so it likewise enters the *Puncta lacrymalia* ; and must necessarily carry with it, towards the *Puncta lacrymalia* and their small Canals, the Moisture that lubricates the Surface of the Ball of the Eye, as it mixes with it. Therefore it is easy to perceive already, that in order to preserve to the Tears their new and artificial Road into the Nose, one need only commit the whole Care to the continual Passage of the Air and Tears. 'Tis well known in good Surgery, that 'tis very difficult, not to say impossible, to effect a re-union in a Part, that serves as an Emunctory to a Liquor constantly flowing to it.

Now let us examine, if Nature alone can stop the Hole made by the Operation. It will not be imagined, that from the Remains of a bony *Lamina*, so thin as the *Os Unguis*, a sufficient Quantity of ossifying Juice can work out to stop it up. The *Periostium* and *Saccus lacrymalis* are too much lacerated, to think it possible for them to repair of themselves what they had lost. Nor will it be believed, that the *Membrana pituitaria* can easily fill up the Hole made in it. Those are the Parts concern'd in the Operation : But even if they are granted to be more disposed to a Re-production than they really are, still the Air and Tears will always be able to preserve themselves a Passage into the Nose.

Wherefore, after having destroy'd the *Saccus lacrymalis* and *Os Unguis*, instead of introducing an extraneous Body capable of making the Orifice of the small common Canal into the *Ductus lacrymalis* become callous, and of drawing on a Suppuration, the Communication between the Nose and Eye must be

left entirely disengaged, and Liberty by this means be given to Respiration to make both the Air alone, and the Air mix'd with the Tears, to pass continually through it.

In fine, the Action of these Fluids may be assisted by the Application of *Collyriums*, and by making frequent Injections into the *Puncta lacrymalia*; which, besides the common Effects that may be naturally expected from them, will contribute to prevent the Juice, that re-unites the Wound made in the Skin, from over-streightening the Canal.

VI. *Concerning the Cause of the General Trade-Winds*: By Geo. Hadley, Esq; F. R. S.

I Think the Causes of the General Trade-Winds have not been fully explained by any of those who have wrote on that Subject, for want of more particularly and distinctly considering the Share the diurnal Motion of the Earth has in the Production of them: For although this has been mention'd by some amongst the Causes of those Winds, yet they have not proceeded to shew how it contributes to their Production; or else have applied it to the Explication of these Phænomena, upon such Principles as will appear upon Examination not to be sufficient.

That the Action of the Sun is the original Cause of these Winds, I think all are agreed; and that it
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